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10/036,504	01/07/2002	Yu-Choung Chang	BHT-3111-227	5149

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EXAMINER	
NGUYEN, TRAN N	
ART UNIT	**PAPER NUMBER**
2834	

DATE MAILED: 12/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/036,504	CHANG ET AL.	
	Examiner	Art Unit	
	Tran N. Nguyen	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *02 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *31-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *31-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on *02 September 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: attachment (1-2)

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Taiwan on 9/19/01. It is noted, however, that applicant has not filed a certified copy of the Taiwanese application as required by 35 U.S.C. 119(b).

Drawings

The drawings were received on 9/02/03. These drawings are approved by the Examiner of the record.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "*the steel pieces further comprise a plurality of dents, each dent forming a concave point on a first surface of the steel pieces and a convex point on a second surface of the steel pieces, such that the plurality of silicon steel pieces are aligned to form the cylindrically shaped rotor core by inserting the plurality of convex points on one of the plurality of silicon steel pieces into the plurality of concave points on another of the plurality of silicon steel pieces*" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. **Claims 34, 38 and 43-44** are rejected under 35 U.S.C. 112, **second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 34, "permeable material" is indefinite because it is unclear what kind of permeable material, is it magnetic or electrical or heat permeable material? In light of the spec, it is understood as magnetic permeable material.

In claim 37, "the plurality of silicon steel pieces" lacks antecedent basis.

In claim 38, "*wherein a third side and a fourth side in each of the plurality of openings are each parallel with an outer radius of the cylindrically shaped rotor core*" is indefinite because the claimed subject matters are not disclosed and supported by the specification. **As shown in figures 4B, 5B**, and disclosed in the application's **specification (pages 8-9)** the opening 25 is with two parallel surfaces, a top surface 251 and a bottom surface 252 (these are read as the first and second surfaces). The top surface 251 is adjacent to contour of rotor core 20 and extends along the circumference contour of the rotor core 20 so as ***to form a side surface 253*** (read as third side and fourth side) ***that is substantially parallel to the outer contour of the rotor core 20 (page 8) and the side surface (253) and the adjacent surface (256) are taper arc surface (page 9).*** Thus, in these preferred embodiments, the side surface 253 is an arc surface, which curvature is equal to the circumference contour of the rotor core 20. In another embodiment (***figs 9A-B, page 10) the surface (253d, 253e) is configured with straight-line surfaces instead of contour surfaces.*** However, the spec. does not disclose *a third side and a fourth side in each of the plurality of openings are each parallel with an outer radius of the cylindrically shaped rotor core.*

In light of the Spec, the above phrase is understood as "*wherein a third side and a fourth side in each of the plurality of openings being one of parallel curve with respect to an outer* ***contour*** *of the cylindrically shaped rotor core and straight-line with respect to the outer contour of the cylindrically shaped rotor core.* "

In claim 43, "at least four sides in the plurality of openings" is unclear. Should it be *at least four sides in each of the plurality of openings?*

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 31-34, 36, 38-39, 42 and 46,** rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaneko** et al **(US 6441524)** in view of **Tajima** et al **(US 5811904)**.

Kaneko discloses a motor having a rotor (figs 1, 13-14) comprising:

a cylindrically shaped rotor core (17) wherein the cylindrically shaped rotor core is made of magnetic permeable material, and constructed as a laminated core, the rotor having:

a central axial hole (13);

a plurality of openings (25) being equally spaced apart,

each of the plurality of openings having at least four sides, a first side and a second side of each of the plurality of openings being parallel, and each of the hole having a third and a fourth sides thereof, wherein each of the third and a fourth sides is straight-line surfaces (*see the Examiner's notation in the ref)*; and

a plurality of permanent magnets (15), each of the plurality of permanent magnets having a cross-section that matches each of the plurality of openings, each magnet being inserted into one of the plurality of openings, wherein the permanent magnets are positioned with interlaced magnetic poles, i.e., in alternative polarities.

Kaneko substantially discloses the claimed invention, except for the following:

(a) a plurality of arched troughs formed around the central axial hole;

(b) a stator having a plurality of teeth being separated by a plurality of slots, the rotor is located in the cylindrical interior of the stator;

(c) the openings are spaced apart at a distance less than 0.7mm.

Regarding the limitations in subsection (a-b), Tajama, however, teaches a motor having a cylindrical rotor located in the cylindrical interior of a stator (figs 1-5), wherein the stator having a plurality of teeth being separated by a plurality of slots. Those skilled in the art would understand that the stator structure is one of the essential part of a motor; the rotor having a plurality of troughs (39, figs 4-5) formed around the central axial hole (38) thereof,

and a plurality of openings formed around the arched, the plurality of openings being equally spaced apart for embedding the magnets therein. Tajama's important teaching for providing the troughs is that the troughs would not only reduce the weight of the rotor, reduce the cost of the material, but also provide ventilating means for the core. Regarding the shape of the troughs is an arch-shaped cross section. Those skilled in the art would realize that the essential teaching of Tajama is to provide the troughs for reducing weight, cost and provide ventilations. Based on this teaching, it would have been obvious, as an engineering design choice, to an artisan to configure the troughs with any suitable size and shape, because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. ***In re Rose,* 105 USPQ 237 (CCPA 1955)** (emphasis added).

Thus, it would have been obvious to one skilled in the art to modify the motor by providing the stator, as taught by Tajama, and configuring the rotor core with a plurality of troughs formed around the central axial hole, as taught by Tajama. Doing so would provide the stator as an essential part of the motor in order for the motor to operate, and as for providing the troughs is that the troughs would not only reduce the weight of the rotor, reduce the cost of the material, but also provide ventilating means for the core. Furthermore, it would have been obvious as an engineering design choice, to an artisan to configure the troughs with any suitable size and shape, because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. ***In re Rose,* 105 USPQ 237 (CCPA 1955)** (emphasis added).

Regarding the limitations in subsection (c), Kaneko discloses the holes are spaced apart at an equal distance around the circumferential direction of the cylindrical rotor. Those skilled in the art would realize that the distance between two adjacent holes can be determined based upon at least one of several engineering design factors such as the size of the cylindrical rotor core, the size of the embedded magnets in the rotor for a required power output; the air gap distance between the rotor and the stator also would determined the size of the magnetic flux barrier between the magnet-embedded holes.

Thus, it would have been obvious to one skilled in the art to modify the motor's rotor by configuring the openings being spaced apart at a distance less than 0.7mm, as recited in the claim 46, because it has been held that where the general conditions of a claim are disclosed

in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. ***In re Aller, 105 USPQ 233.***

3. **Claims 31-34, 36, 39, 41-42 and 46** rejected under 35 U.S.C. 103(a) as being unpatentable over **Tanimoto** et al (JP-4-05176487) in view of **Tajima** et al (**US 5811904**).

Tanimoto substantially discloses the claimed invention (see figs 10, 11). However, Tanimoto does not discloses:

(a) a plurality of arched troughs formed around the central axial hole, and

(b) the openings are spaced apart at a distance less than 0.7mm.

Tajama, however, teaches a motor having a cylindrical rotor located in the cylindrical interior of a stator (figs 1-5); the rotor having a plurality of troughs (39, figs 4-5) formed around the central axial hole (38) thereof. Tajama's important teaching for providing the troughs is that the troughs would not only reduce the weight of the rotor, reduce the cost of the material, but also provide ventilating means for the core. Regarding the shape of the troughs is an arch-shaped cross section. Those skilled in the art would realize that the essential teaching of Tajama is to provide the troughs for reducing weight, cost and provide ventilations. Based on this teaching, it would have been obvious, as an engineering design choice, to an artisan to configure the troughs with any suitable size and shape, because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. ***In re Rose,* 105 USPQ 237 (CCPA 1955)** (emphasis added).

Thus, it would have been obvious to one skilled in the art to modify the motor configuring the rotor core with a plurality of troughs formed around the central axial hole, as taught by Tajama. Doing so would enable to not only reduce the weight of the rotor, reduce the cost of the material, but also provide ventilating means for the core. Furthermore, it would have been obvious as an engineering design choice, to an artisan to configure the troughs with any suitable size and shape, because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. ***In re Rose,* 105 USPQ 237 (CCPA 1955)** (emphasis added).

Regarding the limitations in subsection (b), Tanimoto discloses the holes are spaced apart at an equal distance around the circumferential direction of the cylindrical rotor. Those skilled in

the art would realize that the distance between two adjacent holes can be determined based upon at least one of several engineering design factors such as the size of the cylindrical rotor core, the size of the embedded magnets in the rotor for a required power output; the air gap distance between the rotor and the stator also would determined the size of the magnetic flux barrier between the magnet-embedded holes.

Thus, it would have been obvious to one skilled in the art to modify the motor's rotor by configuring the openings being spaced apart at a distance less than 0.7mm, as recited in the claim 46, because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. ***In re Aller, 105 USPQ 233.***

4. **Claims 31-34, 36, 38-40, 42-46 are** rejected under 35 U.S.C. 103(a) as being unpatentable over **Futami** et al (JP-4-05191936) in view of **Tajima** et al (**US 5811904**).

Futami substantially discloses all features of the claimed invention, particularly the rotor's opening having six sides (*see the Examiner's notation in figs 2-3 of the ref*), wherein

a first side and a second side of each of the plurality of openings being parallel, and each of the hole having a third and a fourth sides thereof, wherein each of the third and a fourth sides is configured with curve surfaces that are in parallel with outer contour of the core (as shown in fig 2) or in another embodiment, the third and a fourth sides is configured with straight-line surfaces which also parallel with the outer contour of the core (as shown in fig 3); furthermore, each of the openings having a fifth side of each of the plurality of openings being parallel with a sixth side of an adjacent one of the plurality of openings (*see the Examiner's notation in figs 2-3 of the ref*).

Tanimoto does not discloses:

(a) a plurality of arched troughs formed around the central axial hole, and

(b) the openings are spaced apart at a distance less than 0.7mm.

Tajama, however, teaches a motor having a cylindrical rotor located in the cylindrical interior of a stator (figs 1-5); the rotor having a plurality of troughs (39, figs 4-5) formed around the central axial hole (38) thereof. Tajama's important teaching for providing the troughs is that the troughs would not only reduce the weight of the rotor, reduce the cost of the material, but

also provide ventilating means for the core. Regarding the shape of the troughs is an arch-shaped cross section. Those skilled in the art would realize that the essential teaching of Tajama is to provide the troughs for reducing weight, cost and provide ventilations. Based on this teaching, it would have been obvious, as an engineering design choice, to an artisan to configure the troughs with any suitable size and shape, because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. ***In re Rose,* 105 USPQ 237 (CCPA 1955)** (emphasis added).

Thus, it would have been obvious to one skilled in the art to modify the motor configuring the rotor core with a plurality of troughs formed around the central axial hole, as taught by Tajama. Doing so would enable not only reduce the weight of the rotor, reduce the cost of the material, but also provide ventilating means for the core. Furthermore, it would have been obvious as an engineering design choice, to an artisan to configure the troughs with any suitable size and shape, because a change in size or shape is generally recognized as being within the level of ordinary skill in the art. ***In re Rose,* 105 USPQ 237 (CCPA 1955)** (emphasis added).

Regarding the limitations in subsection (b), Tanimoto discloses the holes are spaced apart at an equal distance around the circumferential direction of the cylindrical rotor. Those skilled in the art would realize that the distance between two adjacent holes can be determined based upon at least one of several engineering design factors such as the size of the cylindrical rotor core, the size of the embedded magnets in the rotor for a required power output; the air gap distance between the rotor and the stator also would determined the size of the magnetic flux barrier between the magnet-embedded holes.

Thus, it would have been obvious to one skilled in the art to modify the motor's rotor by configuring the openings being spaced apart at a distance less than 0.7mm, as recited in the claim 46, because it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. ***In re Aller, 105 USPQ 233.***

5. **Claim 37 is** rejected under 35 U.S.C. 103(a) as being unpatentable over ***one of the combination of applied references in sections 2-4 herein***, and further in view of **Elliott** et al **(US 5992003)**.

Any one of the combination of applied references in sections 2-4 herein discloses the claimed invention, except for the limitations of *the steel pieces further comprise a plurality of dents, each dent forming a concave point on a first surface of the steel pieces and a convex point on a second surface of the steel pieces, such that the plurality of silicon steel pieces are aligned to form the cylindrically shaped rotor core by inserting the plurality of convex points on one of the plurality of silicon steel pieces into the plurality of concave points on another of the plurality of silicon steel pieces.*

Elliott, however, teaches a laminated core having steel pieces further comprise a plurality of dents, each dent forming a concave point on a first surface of the steel pieces and a convex point on a second surface of the steel pieces, such that the plurality of steel pieces are aligned to form the cylindrically shaped rotor core by inserting the plurality of convex points on one of the plurality of steel pieces into the plurality of concave points on another of the plurality of steel pieces (fig 1A-3B). The stacking lug, i.e., the a concave point on a first surface of the steel pieces and a convex point on a second surface of the steel pieces would enable the steel plates to be stacked without any additional fastening means for securing the steel plates into the laminated rotor core.

Thus, it would have been obvious to one skilled in the art to modify the motor's rotor by configuring of the steel pieces further comprise a plurality of dents, each dent forming a concave point on a first surface of the steel pieces and a convex point on a second surface of the steel pieces, such that the plurality of silicon steel pieces are aligned to form the cylindrically shaped rotor core, as taught by Elliott. Doing so would provide means for the steel plates to be stacked without any additional fastening means for securing the steel plates into the laminated rotor core.

Furthermore, Elliott teaches that any suitable steel material can be used; hence, it would have been obvious to an artisan to select silicon steel material, which is well known in the art, to fabricate the rotor core. Doing so would require only routine skills in the art since it has been to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin, 125 USPQ 416.*

6. **Claim 35 is** rejected under 35 U.S.C. 103(a) as being unpatentable over ***one of the combination of applied references in sections 2-4 herein***, and further in view of **Johnson** et al **(US 5801470)**.

Any one of the combination of applied references in sections 2-4 herein discloses the claimed invention, except for the limitations of *the rotor core is made of a solid silicon steel.*

Johnson, however, teaches that (FIG. 12 is a view similar to that of FIG. 9) a motor rotor (1100) comprises a solid rotor core instead of a laminated rotor core. The solid core rotors are particularly useful for large moderate speed and small high speed induction motor rotors, as taught by Johnson.

Thus, it would have been obvious to one skilled in the art to modify the motor's rotor by configuring of rotor core as a solid steel core, as taught by Johnson. Doing so would provide a suitable solid core rotors are particularly useful for large moderate speed and small high speed induction motors. Furthermore, it would have been obvious to an artisan to select silicon steel material, which is well known in the art, to fabricate the rotor core. Doing so would require only routine skills in the art since it has been to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin, 125 USPQ 416.*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N Nguyen whose telephone number is (703) 308-1639. The examiner can normally be reached on M-F 6:00AM-2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703)-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)-395-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-1782.

TRAN NGUYEN
PRIMARY PATENT EXAMINER
TC-2800